arrangements. We would not, however, seem ungrateful; rather let us hope that the future parts of this volume, though deprived of the care of the great palæontologist, may be equally fruitful of new and interesting facts, and that, in the hands of Dr. Waagen, they may, no less than this one, add still fresh lustre to the name of Barrande.

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## *TEXT-BOOK OF PATHOLOGY.*

*Text-book of Pathology.* By Prof. D. J. Hamilton. Pp. 719. (London: Macmillan and Co., 1889.)

ABROAD, it is usual for a pathologist to devote his whole life and energy to one subject, and to pay little or no attention to the clinical side of disease, concentrating all his attention on the anatomical and histological aspect. This system has both its advantages and its defects. As his future success in life depends solely upon his reputation as a pathologist, he is stimulated to write frequently and much; and one practical outcome is a large number of books, in both German and French, on pathology. These are of very varying excellence, some being mere compilations of the current standard works, while a few represent the results of a mature experience. For naked-eye pathology, English students have an unequalled work in Wilks and Moxon's "Pathology," of which a third edition has recently appeared. Morbid histology is a science of comparatively recent date, and English authors have hitherto confined themselves to writing short manuals for students, which have been supplemented by translations of the more elaborate foreign works.

This "Pathology" is the first English book which has attempted, in its completeness, to compete with the larger Continental works, and as it is the outcome of several years' experience, of one who is already well known for the original work he has published on many of the questions, it will meet with a hearty welcome. The author takes a very wide view of pathology, and includes under this term morbid anatomy, pathological histology, physics, chemistry, and comparative pathology. Theoretically, this is undoubtedly right; but it is extremely inconvenient, when a book is overweighted by collateral subjects; and we think the author would be well advised in a future edition, to omit the chapters on bacteriology and on the experiments which he conducted to illustrate the circulation of the blood. The greater portion of the information on bacteriology is of necessity a repetition of what is given in any text-book on the subject, and is therefore superfluous, except for the purpose of making the book theoretically complete. The experiments on the circulation should be relegated to a book on physiology.

The book commences with a very full account of the method of making a *sectio cadaveri*, with which we would in the main agree. Our experience, however, is entirely opposed to the separation of the heart from the lungs in the body, as he directs. We believe much more may, in a difficult case, be made out if the lungs and heart be removed, and examined together, the amount of blood in the various cavities of the heart having been previously noted.

One of the most valuable portions of the book is that which deals with the preparation of specimens for the museum and for microscopical examination. For the preservation of intestines and other delicate tissues as jar-specimens in a museum, the author recommends a saturated solution of boracic acid; and for eyes, brain, &c., glycerine jelly. Full details are given for the preparation of large sections of the brain by the gelatine-potash method devised by the author, by which he has been able to uniformly expand the sections, so as to more readily show the course of the various bundles of fibres.

The middle third of the book is occupied by a discussion of general pathological processes. The phenomena of inflammation are very fully discussed, and the author gives a good *résumé* of the views now held on the subject, and also of his own conclusions. He considers the blood-pressure to be the cause of the extrusion of the corpuscles which occurs in inflammation. In discussing the phenomena of inflammation of the cornea, he concludes that at first there is an influx into the cornea, which distends the canals and breaks up the endothelial plates; as a consequence, the so-called branching cells of the cornea, which were really the liquid in the plasma spaces, disappear; at the same time the nuclei of the endothelial plates proliferate. The fusiform nuclei which used to be looked upon as the nuclei of the branching cells, he considers to be the nuclei of the fibrous bundles, and as these run in laminæ of parallel bundles, which lie at right angles to those of the adjacent laminæ, the so-called spear-head bodies are formed by their proliferation. The pus comes both from the connective tissue corpuscles and from leucocytes. In granulation tissue, the author holds that the capillary vessels are mainly old capillary loops from the subjacent tissue, which have been pushed up by the pressure of the blood inside them, when the tense surface of epithelium has been destroyed; and he draws attention to the absence of granulations in a wound on the pleura or peritoneum where the surface pressure is still kept up, and considers that the vessels found, when the pores of a piece of sponge applied to a wound become vascularized, are at first not new vessels, but those of the tissue which have pushed up into the pores.

The third part deals with the diseases of the various organs and tissues. Some interesting facts are given as to the means by which tubercle may be spread:—

(*a*) By inoculation. When the poison is introduced subcutaneously, the disease is reproduced with great certainty. It is remarkable, however, how rarely the disease is contracted through superficial scratches by pathologists; for, although tubercle bacilli have been found in *post-mortem* sores, the author thinks no one has become tubercular in consequence; but this is too sweeping a statement.

(*b*) Through ingesta. Rabbits and guinea-pigs readily become tubercular when fed upon tubercular tissues or sputum, while dogs are less readily infected. Herterich has recorded the case of a healthy widow with two children, who married a second husband who had phthisis, by whom she had three children. She herself became phthisical, and her two youngest children developed deep yellow-coloured ulcers on the mouth and fauces, and ultimately general tuberculosis. The children had been fed on food which the mother had previously chewed. Reich records ten cases of tubercular meningitis in a country village, occur-

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ring within fifteen months in the practice of a phthisical midwife, who was in the habit of sucking the mucous from the mouths of the new-born infants, and of blowing air into their lungs. Pigs fed upon the milk of tuberculous cows became tubercular in five weeks.

(*c*) By inhalation. Animals after a few inhalations of tubercular sputum, disseminated in a spray, readily became infected. Koch holds that no other substances than tubercular products when introduced into an animal will produce tuberculosis.

The *résumé* of the changes which take place in the blood in various diseases is most complete and up to date. The latter part of the book deals with the diseases of the circulatory organs.

Among alterations which are desirable in a new edition we would suggest that the forms for the *post-mortem* reports which occupy four pages should be omitted; or, if not, they should be made much more complete. Many important headings, such as lymphatic glands, joints, prostate, &c., are wanting. Fig. 25 is an unfortunate illustration of lardaceous disease of the liver in which the liver cells are affected, and should be replaced by a more typical case with healthy cells. We would demur to the statements that lymphadenoma produces great anæmia and infiltrates tissues—that is, in the sense in which sarcoma is said to infiltrate. The growths extend only along lymph-channels, and do not infiltrate outside these. On p. 82, sulphide of potassium should be sulphite.

We congratulate the author on the general excellence and practical nature of his book, and shall await with interest the second volume. The arrangement of the type, the paper, and the illustrations are unexceptionable, and reflect the greatest credit upon all concerned.

## *OUR BOOK SHELF.*

*A Graduated Course of Natural Science.* Part I. By Benjamin Loewy, F.R.A.S. (London: Macmillan and Co., 1889.)

THIS is an admirable little book which has been prepared for the use of teachers and students in schools where elementary ideas of physics and chemistry form part of the course of training. It is intended for elementary students only, and it is not too much to say that the various experiments and inferences are well within the scope of every boy and girl of ordinary ability. It is but to be expected that during his twenty years' experience the author has become thoroughly acquainted with the difficulties met with by young students, and with the best methods of overcoming them.

An experiment is first described, and the inferences to be drawn are then discussed, the simple conversational style being especially suitable for young pupils. The subjects are arranged in a very natural order, and it would be difficult to suggest improvements. Very practical suggestions are made as to the best way of arranging for each student to perform the experiments. A simple board, about 3 feet long by 18 inches wide, temporarily screwed to the top of the desk, has been found sufficient to accommodate two or three pupils, so that it is an easy matter to have thirty or forty working at the same time. To make the book more useful to teachers, a series of questions has been put at the end of each chapter.

We strongly recommend the book to the notice of teachers likely to be interested in the subjects of which it treats.

*Flora of Switzerland for the use of Tourists and Field-Botanists.* By A. Gremli. Translated from the Fifth Edition, by Leonard W. Paitson. (London: David Nutt, 1889.)

ENGLISH visitors to Switzerland who happen to be interested in botany must often have regretted that they did not possess a really good hand-book of the Swiss flora. The translator of Herr Gremli's well-known work has provided a volume which will exactly meet their wishes. The original book has been widely circulated in Germany, and its materials are so ample, and so carefully and intelligently arranged, that it well deserves its popularity. In the fifth edition many improvements were made, and these are, of course, embodied in the present rendering. Mr. Paitson has also been able to include the new matter presented in the French translation by M. J. J. Vetter (1885), and corrections and additions published (1887) in the latest—the fourth—of Herr Gremli's supplements. Although the work is intended in the first place for persons beginning the study of botany, it contains much information with regard to new species that will be of service to more advanced botanists. We may note that the English volume is clearly printed, and that it is of a size convenient for the use of tourists.

## *LETTERS TO THE EDITOR.*

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

### Coral Reefs.

I AM obliged to Mr. Murray and Dr. Guppy for their courteous replies to my questions. Mr. Murray knows how pleasant a duty it is on the part of Admiralty surveyors to collect materials for the investigation of men of science like himself. Perhaps he will allow me to say that the theory of wave action spreading out the loose materials of a volcanic island is difficult to understand in view of the fact that islands in the same locality, such for instance as Mokongai and Wakaya in the Fiji Group, have their barriers far away from the land on exactly opposite sides. If he will excuse repetition, I desire again to point to the Exploring Isles, and to the great distance between the barrier and the island of Vanua Mbalavu; also to the fact that the waves, for all but a few days in the year, attack the island from a direction varying between south-south-east and east-north-east, principally east-south-east. Although there is much upraised coral at the north end of Vanua Mbalavu, the formation is chiefly volcanic.

The shallow nature of the Na Solo lagoon is, I presume, due to the detritus from the now sunken island, and the fragments from the reef washed over by the heavy seas at high tide. The bank west of Ono, in the Kandavu Group, is terminated by a sunken barrier, similar to that south of Viwa and north-west of Mbengha; and is not a continuous reef awash, because of the muddy streams from Ono sweeping to leeward, and also for the reason, admitted on all sides, that coral does not grow with so much vigour where there is no surf.

Dr. Guppy's simile, of an engineer having constructed and afterwards repaired a bridge, is not, in my opinion, a good one. A bridge is a structure accomplished on mathematical principles, good or bad. If good, it will stand; if bad, it will sooner or later fall. Mr. Darwin's theory, like other theories, is not capable of mathematical proof; and it is deduced from personal observation only in a very limited degree. The second edition of his work indicates, that after thirty-two years' further experience in weighing, deducing, and generalizing of a similar character in other branches of natural history, and receiving the views of those opposed to his theory on this special subject, he still adheres to his original opinion. The principle of his work was, in all cases, very much the same; and, considering the labour which he devoted to the first study of the question several years after he returned from his voyage, it is hardly conceivable that the origin and formation of coral reefs did not occupy a

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